INTRODUCTION

Air in the spinal canal (Pneumorrhachis) is a rare complication of traumatic spinal injuries reported at various levels of the spinal canal. Pneumorrhachis resolves spontaneously most of the times. Rarely, it may cause cord compression. It is important to rule out potentially serious causes like basilar skull fracture, injury to lungs, mediastinum, mastoid air cells, frontal sinuses or intestine. We present a case of pneumorrhachis in a young soldier who sustained gunshot wound in neck, resulting in spinal cord injury. He was managed conservatively and pneumorrhachis resolved spontaneously without complications. Pathogenesis along with review of relevant literature is presented.

CASE REPORT

A 32 years old previously healthy male soldier sustained a gunshot wound to lower portion of the neck during a military operation. The bullet entered anteriorly on the left side of the neck. He had immediate loss of movement in all four limbs along with loss of sensation. He fell down, but did not lose consciousness. He was evacuated to a tertiary care hospital by road. Upon arrival, he had stable vital signs with a Glasgow Coma Scale score of 15 and could recount the events leading to his injury. There were no complaints of dysphagia or respiratory difficulty at presentation and during his stay at the rehabilitation department.

X-rays of the thoracic spine revealed comminuted fracture of the first dorsal vertebra (DV1), while X-ray chest was negative for pneumothorax or mediastinal widening (Figure 1). He underwent CT scan of the cervicodorsal spine. It was suggestive of fracture of spinous process and left lamina of DV1 along with spinal stenosis and air in the spinal canal (epidural pneumorrhachis) (Figure 2). There was no gross spinal instability.

Clinically, the patient had spinal cord injury (SCI) T2 American Spinal Injury Association Impairment Scale-A. Debridement of the gunshot wounds was performed. He was managed conservatively for the spinal fracture and evacuation.

ABSTRACT

Air in the spinal canal (Pneumorrhachis) is a rare complication of traumatic spinal injuries reported at various levels of the spinal canal. Pneumorrhachis resolves spontaneously most of the times. Rarely, it may cause cord compression. It is important to rule out potentially serious causes like basilar skull fracture, injury to lungs, mediastinum, mastoid air cells, frontal sinuses or intestine. We present a case of pneumorrhachis in a young soldier who sustained gunshot wound in neck, resulting in spinal cord injury. He was managed conservatively and pneumorrhachis resolved spontaneously without complications. Pathogenesis along with review of relevant literature is presented.

Key words: Pneumorrhachis, Air, Spinal canal, Spinal cord injury, Gunshot wound, Pakistan.
transferred to our rehabilitation unit, 2 weeks after the injury. He underwent a comprehensive SCI rehabilitation program, which included physical therapy, transfer training, wheelchair mobility skills, occupational therapy, bladder and bowel management and counselling sessions. The gunshot wound healed well and his 6 months stay in the rehabilitation department was uneventful. The air in the spinal canal did not interfere with the mobility or rehabilitation protocols of the patient. A repeat CT scan after 2 months showed complete resolution of the pneumorrhachis. At one year follow-up there was no improvement in the neurological status of the patient and he is wheelchair dependent for mobility.

DISCUSSION

Pneumorrhachis is a rare finding after spinal trauma. An excellent recent review by Chaichana et al. located only 50 reported cases so far. Air in spinal canal was reported for the first time by Newbold and colleagues in 1987, in a young male involved in an automobile accident. The air in the cervical spinal canal in that case was attributed to the basilar skull fracture. The authors postulated that the basilar skull fracture was the entry point of air into the cranium which later tracked into the cervical spinal canal. They further emphasized that all cases of cervical pneumorrhachis should be investigated for co-existing cranial injuries.

Pneumorrhachis after gunshot wound to spine is a rare entity. Large series of gunshot injuries of the spine have been described in literature, but, pneumorrhachis has not been mentioned in any of them. An extensive review of the national and international biomedical literature did not identify any reported case of pneumorrhachis from Pakistan.

The differential diagnosis of traumatic pneumorrhachis is diverse. Exact cause could not be established in this case. The possible sources of air in this case could be lungs, oesophageal tear/rupture, posttraumatic pneumomediastinum or intervertebral discs. Patient’s history, clinical examination and imaging studies ruled out possibility of oesophageal rupture or pneumomediastinum. Chest X-rays and CT chest did not show pneumothorax. The vacuum disc phenomenon that has been described as a possible cause of traumatic pneumorrhachis in older patients with degenerative disc disease was unlikely considering the young age of the patient.

No specific treatment for the air in spinal canal was offered in this case as the general condition and neurological status of the patient remained stable. Mere presence of air in spinal canal is not itself significant but it gives clues to other possible dangerous underlying aetiologies.

Presence of air in spinal canal itself is harmless and absorbs spontaneously in due course of time, yet some patients may require surgical interventions. Careful evaluation should include scans of skull, thoracic and lumbosacral region along with attention to hollow viscus. It is important to rule out the serious life-threatening aetiologies and to offer prompt effective surgical measures, if needed.

REFERENCES